CLAIMS

What is claimed is:

1.   A method for providing guaranteed Quality of Services (QoS) in an IP network, comprising:

a. after receiving a service request with guaranteed QoS requirement from a subscriber, a relevant service entity in the network obtaining the addresses of source subscriber and destination subscriber and QoS parameters for the service through analyzing the service request, and sending a route selection and resource application request to bearer control layer of the network;

b. a bearer network resource manager in the bearer control layer allocating route and resources for the service in the service bearer logic network according to said addresses of the source subscriber and the destination subscriber and service type; and

c. forwarding the traffic streams in the service bearer logic network according to the route and resources determined by the bearer control layer.

2.   The method according to Claim 1, wherein said service bearer logic network is pre-planned and pre-configured from basic network according to the service type.

3.   The method according to Claim 2, wherein said service bearer logic network includes edge nodes and tandem switching nodes between which Label Switched Path (LSP) connections are established with Multi-Protocol Label Switching (MPLS) technology.

4.   The method according to Claim 3, wherein said tandem switching nodes are a part of core routers which are selected from network resource management areas.

5.   The method according to Claim 1, wherein said service bearer logic network includes edge nodes and tandem switching nodes between which LSP connections are established with MPLS technology.

6.   The method according to Claim 5, wherein said tandem switching nodes are a part of core routers which are selected from network resource management areas.

7.   The method according to Claim 1, wherein said route allocated for the service is represented with a multi-level label stack, in step c, nodes in the service bearer logic network forward the traffic stream according to labels configured in the multi-level label stack; and the levels of the multi-level label stack is decreased by one level whenever a MPLS packet for the service passes a tandem switching node.

8.   The method according to Claim 7, wherein during forwarding traffic stream data packets, the just passed LSP ends whenever a traffic stream data packet passes a tandem switching node, the label representing said LSP in the multi-level label stack is popped at this switching node or the second last hop router in the LSP, then said tandem switching node forwards said packet according to the current top label representing the next LSP.

9.   The method according to Claim 1, step b further comprising the step of informing the service control layer to reject the service request from the subscriber when a bearer network resource manager finds the route selection is failed due to not enough resources in the logic topology of the area.

10.   The method according to Claim 1, wherein said service bearer logic networks have the same topology or different topologies for each service type.

11.   The method according to Claim 1, wherein the network structure of said service bearer logic network is identical with or similar to that of a public telephone network.

12.   The method according to Claim 1, wherein said service bearer logic network can be a metropolitan area network, a provincial backbone network, a national backbone network or even an international backbone network.

13.   The method according to Claim 1, wherein said service bearer logic network is divided into different network resource management areas which are respectively managed by correspondent bearer network resource manager.

14.   The method according to Claim 1, wherein the network is an IP backbone network, a local area network, a metropolitan network or an internetwork network.

15.   The method according to Claim 1, wherein the service with guaranteed QoS requirement is a voice service, a video communication service, a stream media video service or other service with special QoS requirement.

16.   The method according to Claim 1, further comprising: after a subscriber terminates or finishes the service, said bearer control layer releasing resources occupied by the service, and informing correspondent edge routers to cancel processing for the traffic stream.

17. A system for providing guaranteed QoS in an IP network, comprising:

a basic network layer including edge routers and core routers, for bearing various IP service packets;

a service bearer logic layer planed and configured from the basic network, including edge nodes, tandem switching nodes and connections among them, for bearing traffic streams with guaranteed QoS requirements;

a bearer control layer including resource managers, for managing the bearer network resources of said service bearer logic layer and basic network layer; and

a service control layer including service entities, for processing service requests.

18. The method according to Claim 17, wherein the logic connections between nodes in the service bearer logic layer are LSP connections established with MPLS technology.